

**Abstract**

A housing (30) surrounds at least a portion of an x-ray tube (1). A cooling system (32, 32') supplies a  
5 cooling liquid through the housing. The cooling system includes a pump (40, 40') and a flow sensor system (60, 60') which measures a pressure difference across the pump. A processor (80, 80', 82, 82') determines a cooling fluid flow rate from the pressure difference. A controller (81, 81',  
10 82, 82', 107) limits operation of the x-ray tube based on the cooling fluid flow rate and a measured temperature of the cooling fluid to prevent x-ray tube overheating while minimizing cooling time between x-ray tube operations.